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(54) **CONTAINER VERIFICATION THROUGH AN ELECTRICAL RECEPTACLE AND PLUG ASSOCIATED WITH A CONTAINER AND A TRANSPORT VEHICLE OF AN INTERMODAL FREIGHT TRANSPORT SYSTEM**

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USPC 340/989, 539.17, 572.1, 568.1, 539.1; 455/456.1; 342/357.24
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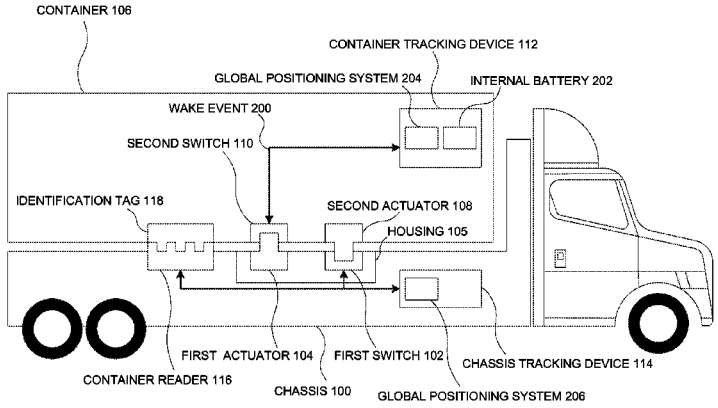
(57) **ABSTRACT**

A method and system related to container identification through an electrical receptacle and plug associated with the container of an intermodal freight transport system is disclosed. According to one embodiment, a method includes coupling an electrical power plug of a container and an electrical power receptacle of a transport vehicle. Also, the method includes activating a tracking device of the container through a switch and actuator coupling. Further, the method includes verifying an identity of the container upon coupling the electrical power plug to the electrical power receptacle through an identification tag of the container and an electronic reader. Furthermore, the method may include conserving battery power through deactivating the tracking device of the container when the electrical power plug is de-coupled to the electrical power receptacle. The method may also include delivering an alert message to a driver when an incorrect container is identified.

54 Claims, 13 Drawing Sheets



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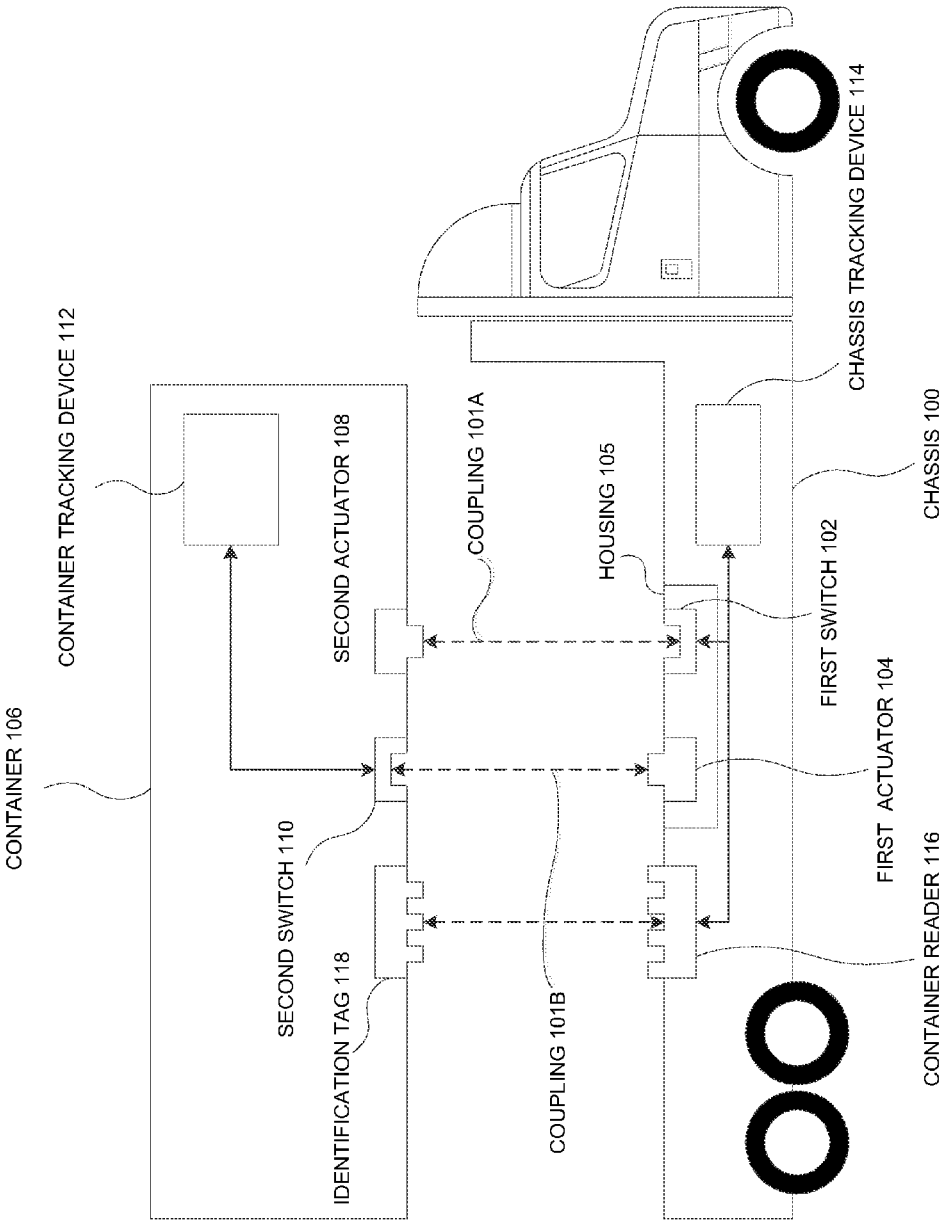

CONTAINER 106
CONTAINER TRACKING DEVICE 112
SECOND ACTUATOR 108
COUPLING 101A
HOUSING 105
CHASSIS TRACKING DEVICE 114
CHASSIS 100
FIRST SWITCH 102
FIRST ACTUATOR 104
SECOND SWITCH 110
IDENTIFICATION TAG 118
COUPLING 101B
CONTAINER READER 116

FIGURE 1

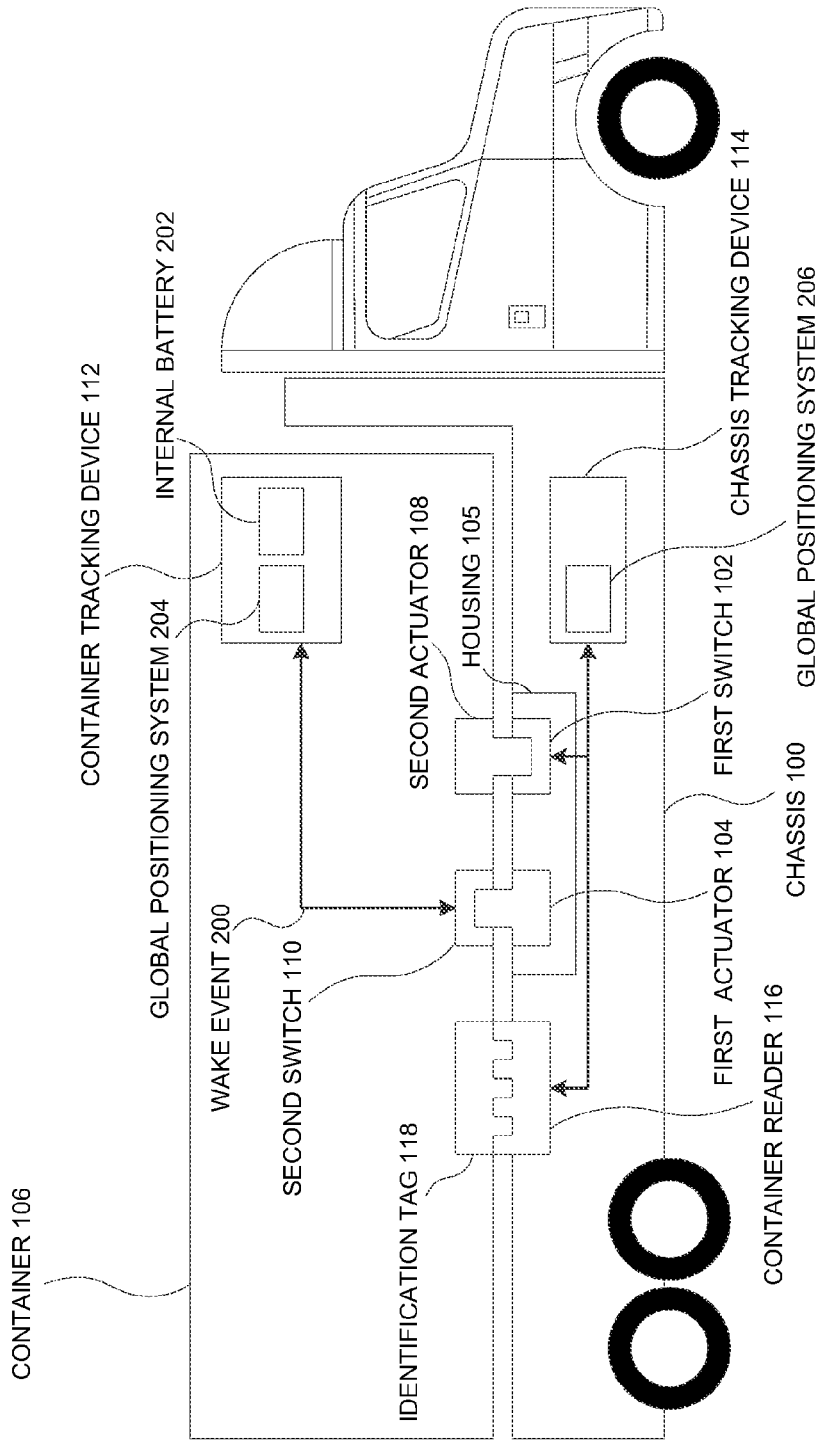

CONTAINER 106
IDENTIFICATION TAG 118
SECOND SWITCH 110
WAKE EVENT 200
GLOBAL POSITIONING SYSTEM 204
CONTAINER TRACKING DEVICE 112
INTERNAL BATTERY 202
SECOND ACTUATOR 108
HOUSING 105
FIRST ACTUATOR 104
FIRST SWITCH 102
CONTAINER READER 116
CHASSIS 100
CHASSIS TRACKING DEVICE 114
GLOBAL POSITIONING SYSTEM 206

FIGURE 2

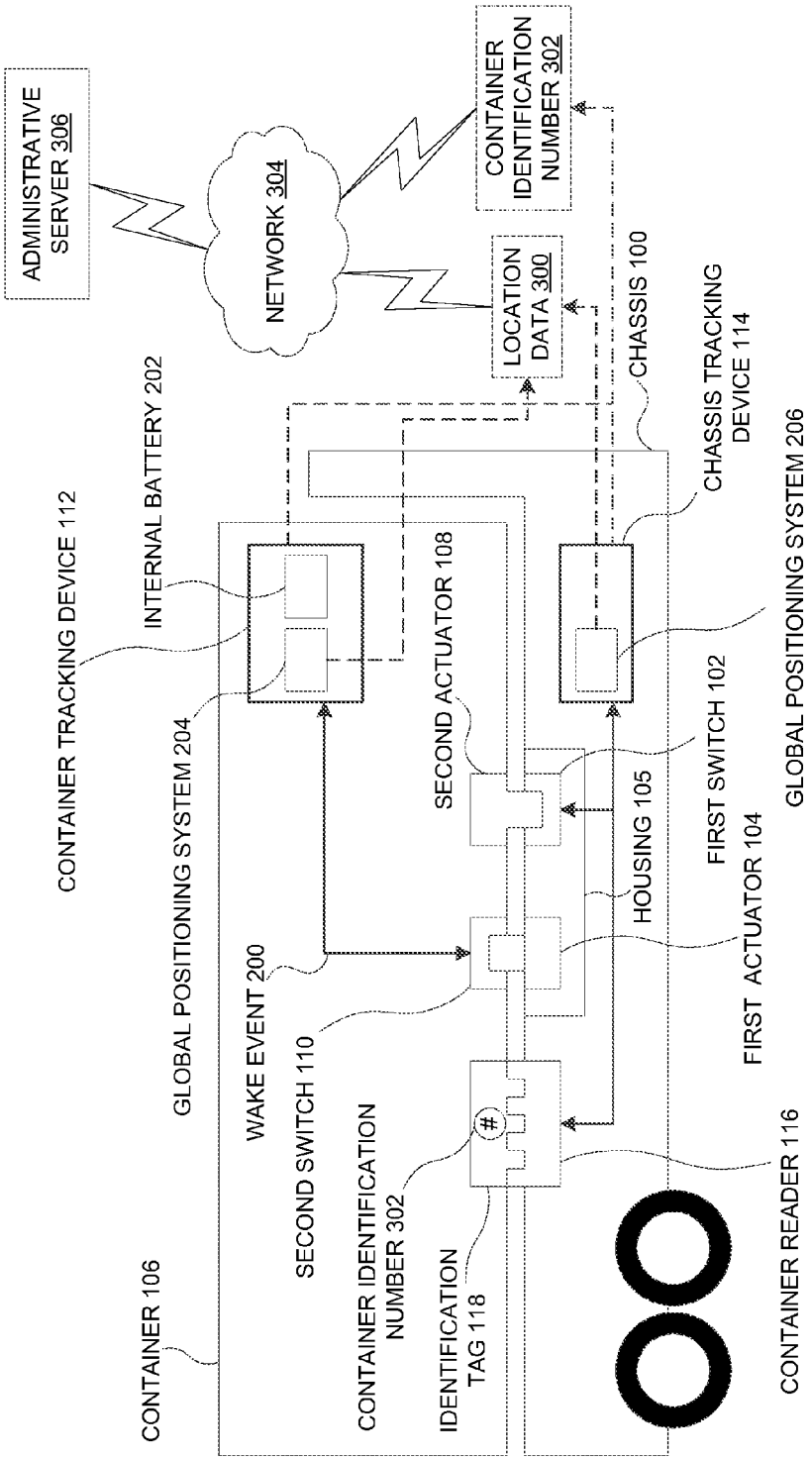

ADMINISTRATIVE SERVER 306
NETWORK 304
CONTAINER IDENTIFICATION NUMBER 302
LOCATION DATA 300
CHASSIS 100
CHASSIS TRACKING DEVICE 114
GLOBAL POSITIONING SYSTEM 206
FIRST SWITCH 102
FIRST ACTUATOR 104
HOUSING 105
SECOND ACTUATOR 108
INTERNAL BATTERY 202
CONTAINER TRACKING DEVICE 112
GLOBAL POSITIONING SYSTEM 204
WAKE EVENT 200
SECOND SWITCH 110
CONTAINER IDENTIFICATION NUMBER 302
IDENTIFICATION TAG 118
CONTAINER 106
CONTAINER READER 116

FIGURE 3

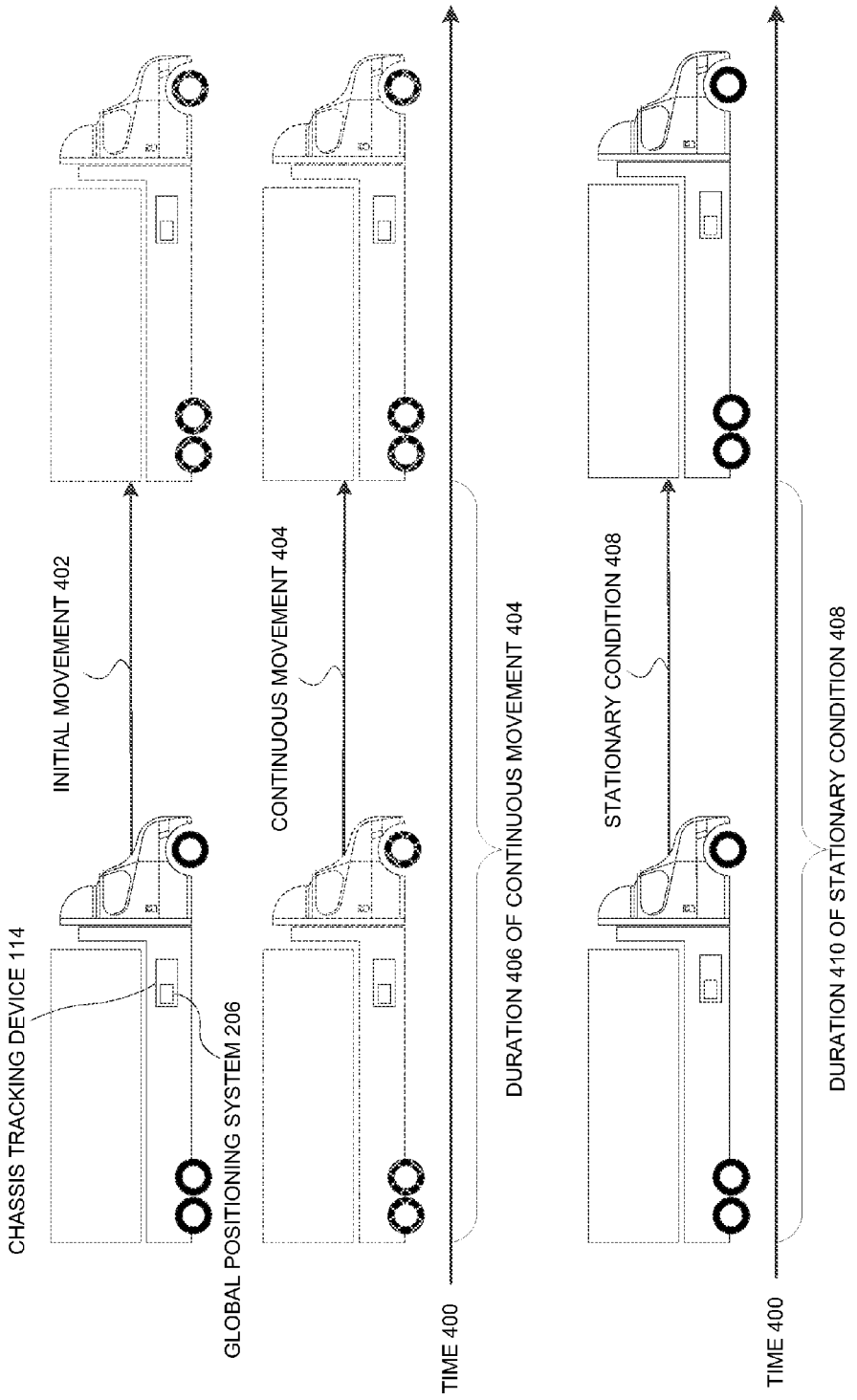
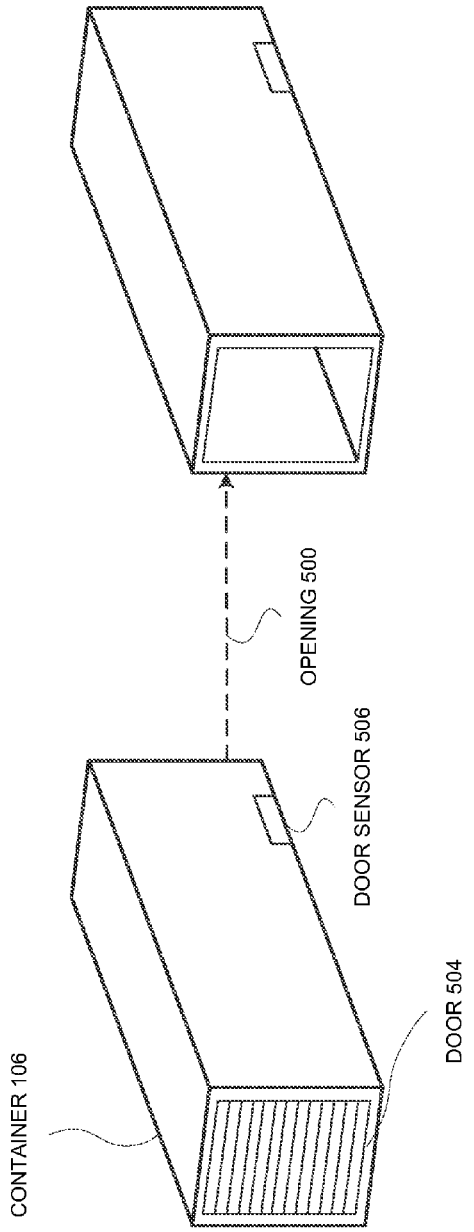

CHASSIS TRACKING DEVICE 114
GLOBAL POSITIONING SYSTEM 206
INITIAL MOVEMENT 402
CONTINUOUS MOVEMENT 404
DURATION 406 OF CONTINUOUS MOVEMENT 404
TIME 400
STATIONARY CONDITION 408
DURATION 410 OF STATIONARY CONDITION 408
TIME 400

FIGURE 4


CONTAINER 106
DOOR 504
DOOR SENSOR 506
OPENING 500

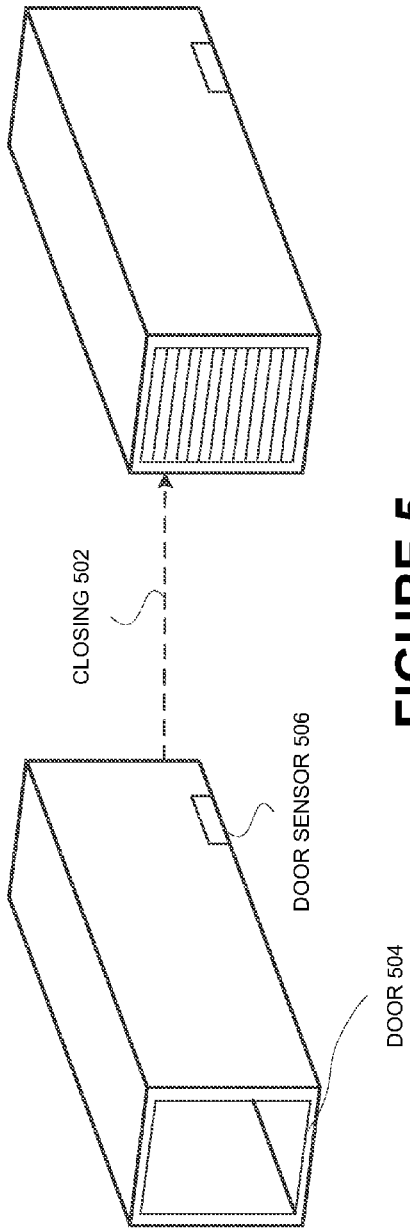

DOOR 504
DOOR SENSOR 506
CLOSING 502

FIGURE 5

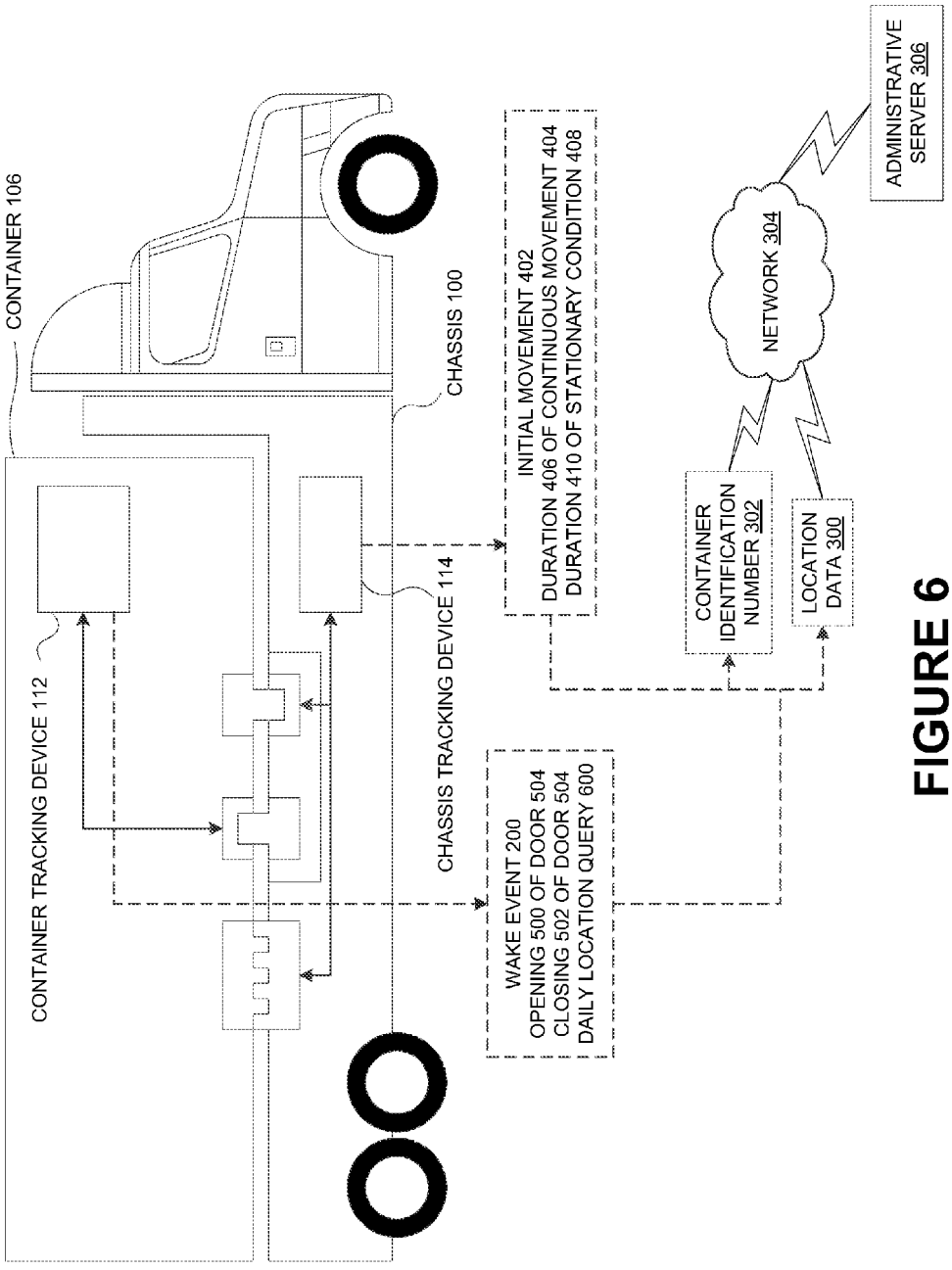

CONTAINER 106
CHASSIS 100
CONTAINER TRACKING DEVICE 112
CHASSIS TRACKING DEVICE 114
INITIAL MOVEMENT 402
DURATION 406 OF CONTINUOUS MOVEMENT 404
DURATION 410 OF STATIONARY CONDITION 408
WAKE EVENT 200
OPENING 500 OF DOOR 504
CLOSING 502 OF DOOR 504
DAILY LOCATION QUERY 600
CONTAINER IDENTIFICATION NUMBER 302
LOCATION DATA 300
NETWORK 304
ADMINISTRATIVE SERVER 306

FIGURE 6

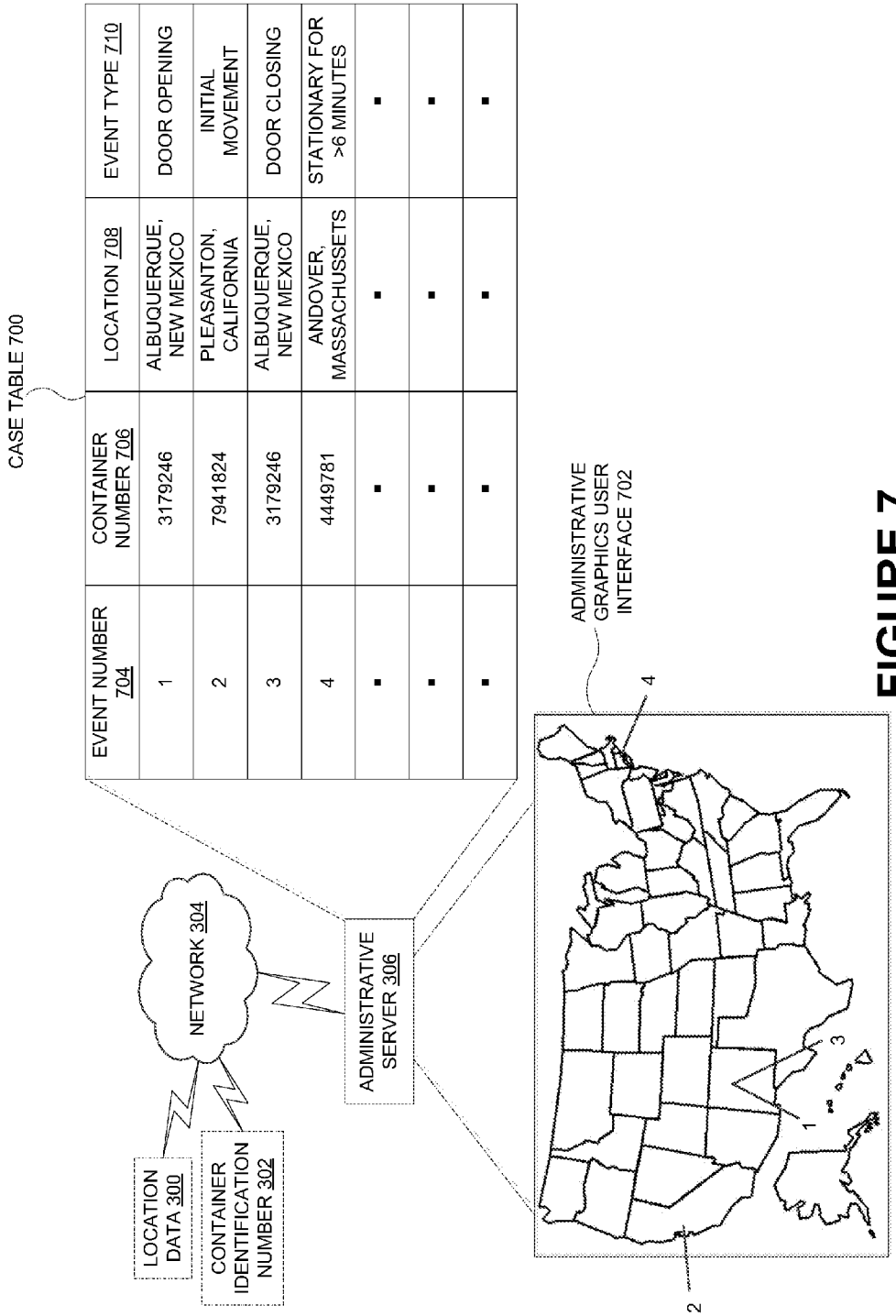

CASE TABLE 700
EVENT NUMBER 704
CONTAINER NUMBER 706
LOCATION 708
EVENT TYPE 710
1
3179246
ALBUQUERQUE, NEW MEXICO
DOOR OPENING
2
7941824
PLEASANTON, CALIFORNIA
INITIAL MOVEMENT
3
3179246
ALBUQUERQUE, NEW MEXICO
DOOR CLOSING
4
4449781
ANDOVER, MASSACHUSSETS
STATIONARY FOR >6 MINUTES
LOCATION DATA 300
CONTAINER IDENTIFICATION NUMBER 302
NETWORK 304
ADMINISTRATIVE SERVER 306
ADMINISTRATIVE GRAPHICS USER INTERFACE 702
1
2
3
4

FIGURE 7

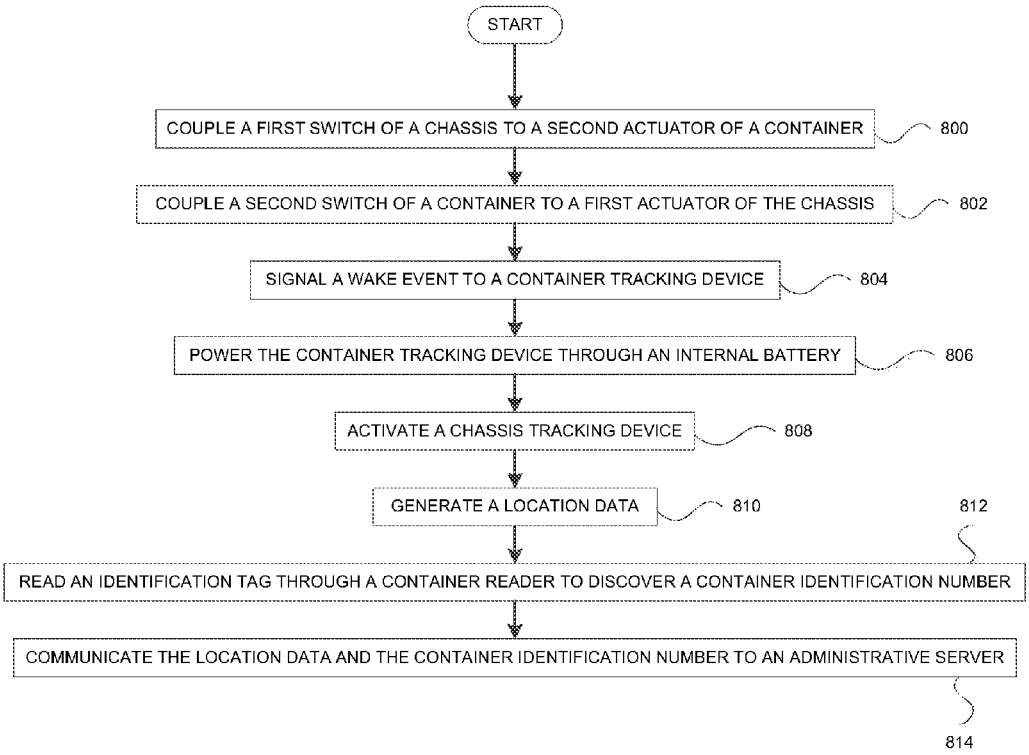

START
COUPLE A FIRST SWITCH OF A CHASSIS TO A SECOND ACTUATOR OF A CONTAINER
800
COUPLE A SECOND SWITCH OF A CONTAINER TO A FIRST ACTUATOR OF THE CHASSIS
802
SIGNAL A WAKE EVENT TO A CONTAINER TRACKING DEVICE
804
POWER THE CONTAINER TRACKING DEVICE THROUGH AN INTERNAL BATTERY
806
ACTIVATE A CHASSIS TRACKING DEVICE
808
GENERATE A LOCATION DATA
810
812
READ AN IDENTIFICATION TAG THROUGH A CONTAINER READER TO DISCOVER A CONTAINER IDENTIFICATION NUMBER
COMMUNICATE THE LOCATION DATA AND THE CONTAINER IDENTIFICATION NUMBER TO AN ADMINISTRATIVE SERVER
814

FIGURE 8

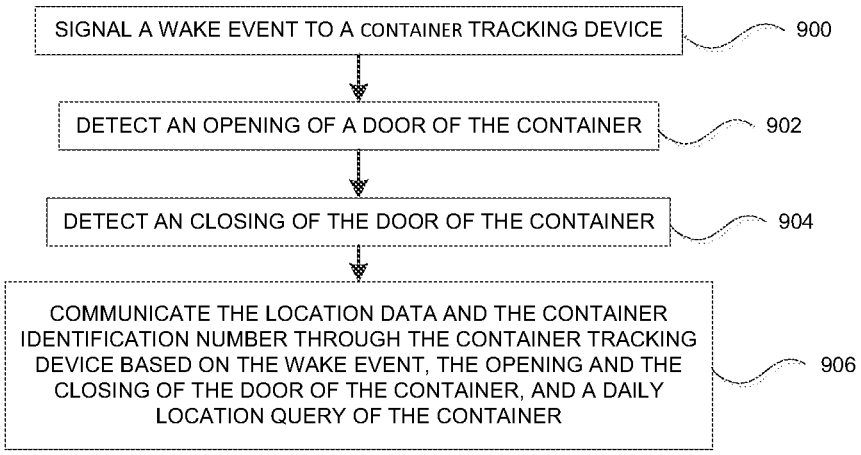

SIGNAL A WAKE EVENT TO A CONTAINER TRACKING DEVICE
900
DETECT AN OPENING OF A DOOR OF THE CONTAINER
902
DETECT AN CLOSING OF THE DOOR OF THE CONTAINER
904
COMMUNICATE THE LOCATION DATA AND THE CONTAINER IDENTIFICATION NUMBER THROUGH THE CONTAINER TRACKING DEVICE BASED ON THE WAKE EVENT, THE OPENING AND THE CLOSING OF THE DOOR OF THE CONTAINER, AND A DAILY LOCATION QUERY OF THE CONTAINER
906

FIGURE 9

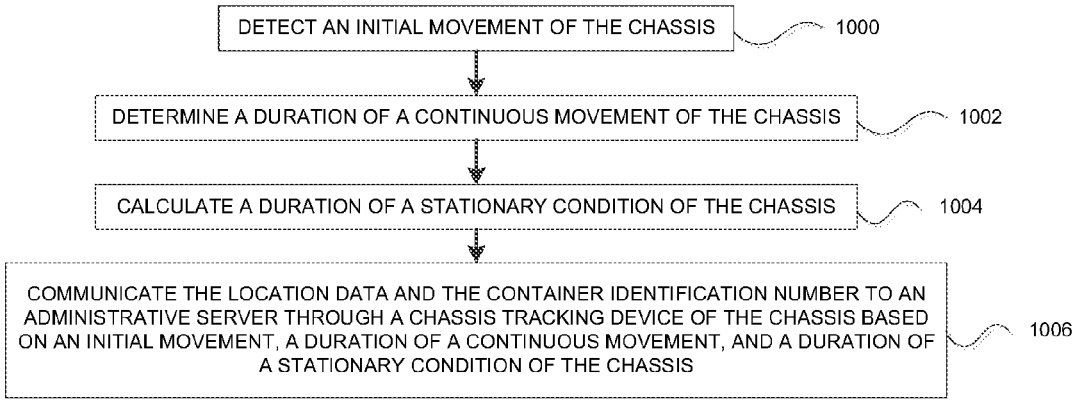

DETECT AN INITIAL MOVEMENT OF THE CHASSIS
1000
DETERMINE A DURATION OF A CONTINUOUS MOVEMENT OF THE CHASSIS
1002
CALCULATE A DURATION OF A STATIONARY CONDITION OF THE CHASSIS
1004
COMMUNICATE THE LOCATION DATA AND THE CONTAINER IDENTIFICATION NUMBER TO AN ADMINISTRATIVE SERVER THROUGH A CHASSIS TRACKING DEVICE OF THE CHASSIS BASED ON AN INITIAL MOVEMENT, A DURATION OF A CONTINUOUS MOVEMENT, AND A DURATION OF A STATIONARY CONDITION OF THE CHASSIS
1006

FIGURE 10

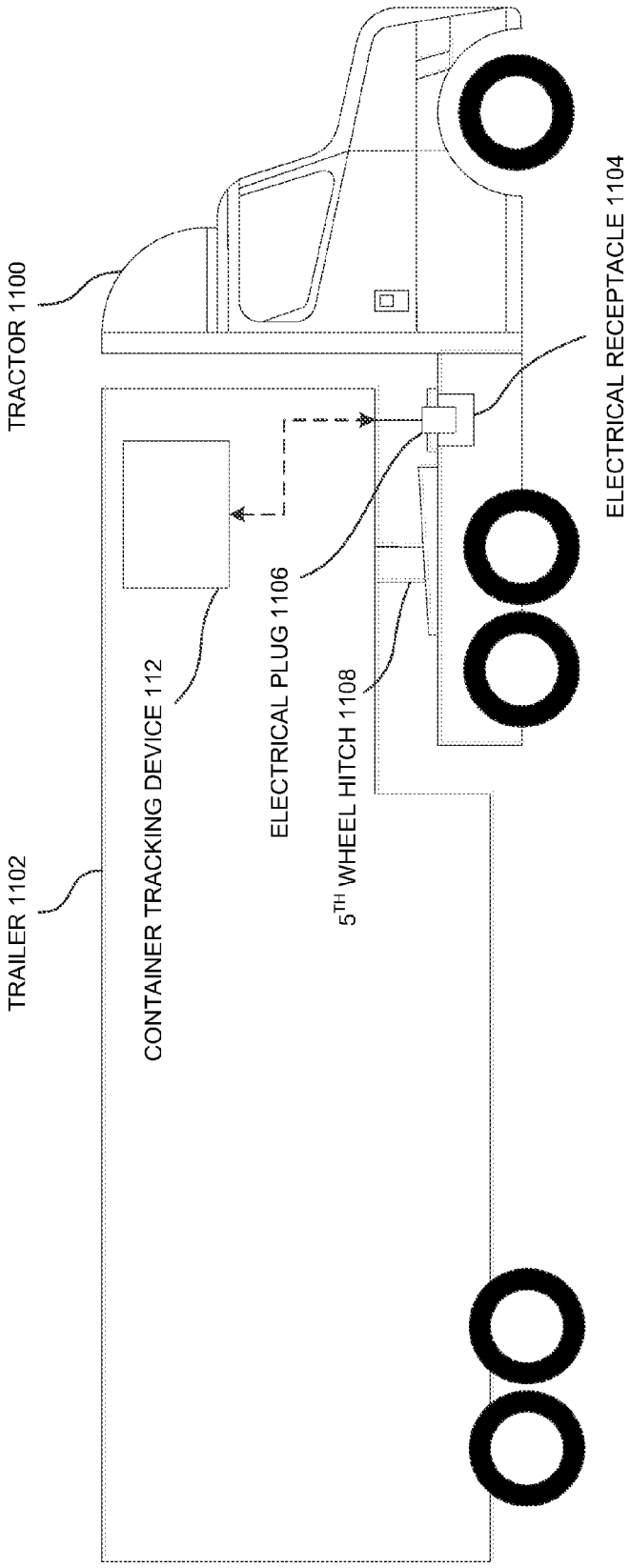

TRACTOR 1100
ELECTRICAL RECEPTACLE 1104
ELECTRICAL PLUG 1106
5TH WHEEL HITCH 1108
CONTAINER TRACKING DEVICE 112
TRAILER 1102

FIGURE 11

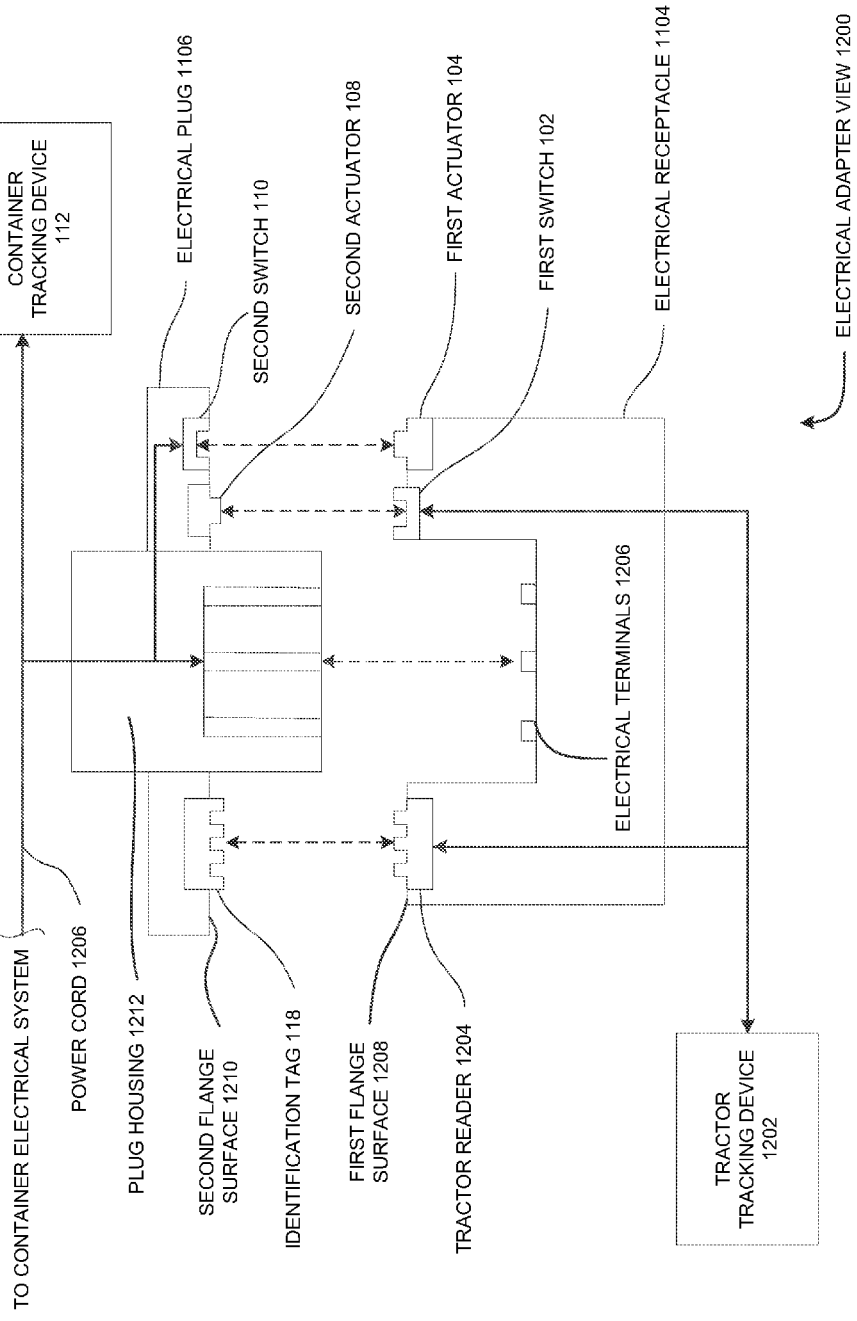

CONTAINER TRACKING DEVICE 112
ELECTRICAL PLUG 1106
SECOND SWITCH 110
SECOND ACTUATOR 108
FIRST ACTUATOR 104
FIRST SWITCH 102
ELECTRICAL RECEPTACLE 1104
ELECTRICAL ADAPTER VIEW 1200
ELECTRICAL TERMINALS 1206
TO CONTAINER ELECTRICAL SYSTEM
POWER CORD 1206
PLUG HOUSING 1212
SECOND FLANGE SURFACE 1210
IDENTIFICATION TAG 118
FIRST FLANGE SURFACE 1208
TRACTOR READER 1204
TRACTOR TRACKING DEVICE 1202

FIGURE 12

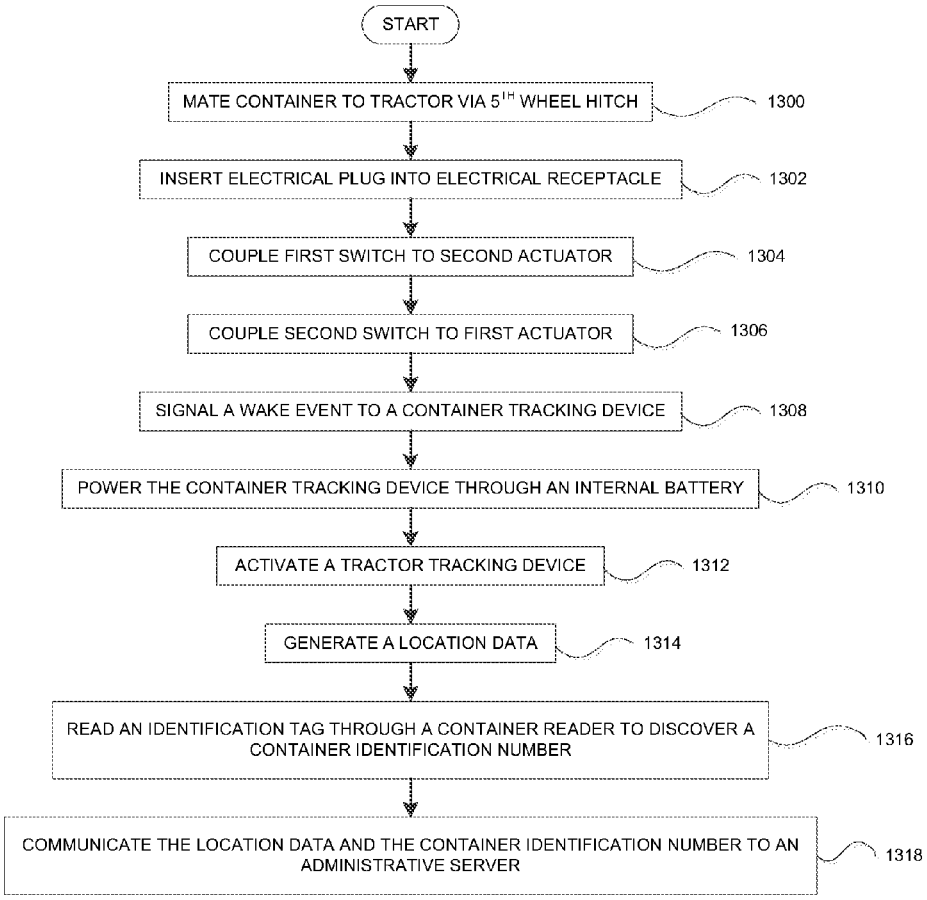

START
MATE CONTAINER TO TRACTOR VIA 5TH WHEEL HITCH
1300
INSERT ELECTRICAL PLUG INTO ELECTRICAL RECEPTACLE
1302
COUPLE FIRST SWITCH TO SECOND ACTUATOR
1304
COUPLE SECOND SWITCH TO FIRST ACTUATOR
1306
SIGNAL A WAKE EVENT TO A CONTAINER TRACKING DEVICE
1308
POWER THE CONTAINER TRACKING DEVICE THROUGH AN INTERNAL BATTERY
1310
ACTIVATE A TRACTOR TRACKING DEVICE
1312
GENERATE A LOCATION DATA
1314
READ AN IDENTIFICATION TAG THROUGH A CONTAINER READER TO DISCOVER A CONTAINER IDENTIFICATION NUMBER
1316
COMMUNICATE THE LOCATION DATA AND THE CONTAINER IDENTIFICATION NUMBER TO AN ADMINISTRATIVE SERVER
1318

FIGURE 13

CONTAINER VERIFICATION THROUGH AN ELECTRICAL RECEPTACLE AND PLUG ASSOCIATED WITH A CONTAINER AND A TRANSPORT VEHICLE OF AN INTERMODAL FREIGHT TRANSPORT SYSTEM

CLAIM OF PRIORITY

This patent application is a Continuation-In-Part patent application, claiming priority from U.S. patent application Ser. No. 13/668,698, titled SWITCH AND ACTUATOR COUPLING IN A CHASSIS OF A CONTAINER ASSOCIATED WITH AN INTERMODAL FREIGHT TRANSPORT SYSTEM filed on Nov. 5, 2012.

FIELD OF TECHNOLOGY

This disclosure relates generally to the technical field of geospatial freight tracking, and in one example embodiment, to a method and system of container verification through an electrical receptacle and plug associated with a container and a transport vehicle of an intermodal freight transport system.

BACKGROUND

In an intermodal freight distribution business, a client may wish to track a container of a shipment of goods delivered through a land based route (e.g., by train, bus, truck). For example, the client may wish to estimate how long the shipment of containers may take to reach a destination. Furthermore, the client may wish to receive a report of an event related to a movement and/or a manipulation of the container of the shipment (e.g. loading/unloading on a freight train or tractor chassis, opening/closing of doors). Tracking devices may not work when placed on the container of the shipment because there may not be enough power during the shipment. In addition, a harsh and an inclement environment may damage any external items (e.g. tracking devices) affixed to the container.

Further, a container fixed to a chassis with wheels (e.g., semi-truck trailer) may mate with a tractor (e.g., semi-truck or articulated vehicle) in a shipping yard. A driver of the tractor may become confused in the shipping yard and may mate to the wrong trailer. The trailer may be located at a wrong terminal and may also cause the driver to mate to the wrong trailer. The trailer and goods onboard may be delivered to the wrong location. The owner of the goods may suffer monetary losses. Also, a shipping company may suffer fuel and/or time losses in addition to any fees paid due to damages. Thus, the shipping company may wish to verify that a correct trailer has been mated to a correct tractor.

Additionally, the shipping company may wish to have a verification mechanism that requires no additional work process and/or action on the part of the driver. For example, in a typical scenario, the driver may mate the trailer to the tractor via 5th wheel hitch. Also, the driver may connect an electrical system of the tractor to the trailer in order to power the trailer (e.g., trailer lights, blinkers, communication to tractor). Thus, the shipping company may wish to have verification and/or geospatial tracking occur while the driver performs no more actions than these.

SUMMARY

A method and system related to container verification through an electrical receptacle and an electrical plug associated with a container and a transport vehicle of an intermodal freight transport system is disclosed. In one aspect, a method of an intermodal transport tracking system includes coupling an electrical power plug of a container and an electrical power receptacle of a transport vehicle. Further, the method includes activating a tracking device of the container through a switch and actuator coupling of at least one of the electrical power plug and the electrical power receptacle. Furthermore, the method includes verifying an identity of the container upon coupling the electrical power plug to the electrical power receptacle through an identification tag of the container and an electronic reader.

In another aspect, a method of an intermodal transport tracking system involves activating a tracking device of at least one of a container and a transport vehicle through a switch and actuator coupling of an electrical power plug and an electrical power receptacle. The method also involves generating a location data, when the electrical power plug is coupled to electrical power receptacle, through a global positioning system (GPS) of the tracking device. Further, the method involves reading an identification tag of the container, through an electronic reader of the electrical power receptacle, to discover an identification number upon a mate event.

According to another aspect, a system includes an electrical power receptacle of a transport vehicle and an electrical power plug of a container. Also, the system includes a switch and actuator coupling to signal a mate event between the electrical power plug and the electrical power receptacle. Further, the system includes an electronic reader and an identification tag comprising a container number, wherein the container number may confirm an identity of the container. The system also includes a tracking device to provide location data associated with at least one of the container and the transport vehicle. Furthermore, the system includes an administrative server to gather location data, wherein the tracking device is communicatively coupled therewith.

The methods, system, and/or apparatuses disclosed herein may be implemented in any means for achieving various aspects, and may be executed in a form of machine readable medium embodying a set of instruction that, when executed by a machine, causes the machine to perform any of the operation disclosed herein. Other features will be apparent from the accompanying drawing and from the detailed description that follows.

BRIEF DESCRIPTION OF DRAWINGS

Example embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawing, in which like references indicate similar elements and in which:

FIG. **1** is a schematic view illustrating a coupling of a container to a chassis pulled by a truck tractor, according to one embodiment.

FIG. **2** is a schematic view illustrating an activation of a container reader of a chassis, a container tracking device and a chassis tracking device based on the coupling, of FIG. **1**, of the container to the chassis, according to one embodiment.

FIG. **3** is schematic view illustrating a communication of a location data and a container identification number to an administrative server through a network by at least one of the container tracking device and the chassis tracking device of FIG. **2**, according to one embodiment.

FIG. **4** is a time lapse diagram depicting a detection of an initial movement of the chassis of FIG. **1** and a calculation of

a duration of continuous movement of the chassis and a duration of a stationary condition of the chassis, according to one embodiment.

FIG. **5** portrays an opening and a closing of a door of a container as detected through a door sensor of the container of FIG. **1**, according to one embodiment.

FIG. **6** illustrates a communication of a container tracking device and a chassis tracking device of FIG. **1** to an administrative server of FIG. **3** through a network based on a set of events triggering the communication, according to one embodiment.

FIG. **7** depicts an administrative view of a case table listing a plurality of communication events associated with an intermodal freight transport system and a graphics user interface view illustrating a geographical origin of the events based on the communication of FIG. **3** of a location data and a container identification number to an administrative server through the network, according to one embodiment.

FIG. **8** is a process flow chart outlining the coupling, of FIG. **1**, of a container and a chassis and a subsequent communication of a location data and a container identification number to an administrative server through at least one of a container tracking device and a chassis tracking device, according to one embodiment.

FIG. **9** is a process flow chart describing a set of events triggering the communication of FIG. **3** of a location data and a container identification number to an administrative server through a container tracking device, according to one embodiment.

FIG. **10** is a process flow chart describing a set of events triggering a communication of a location data and a container identification number to an administrative server through a chassis tracking device, according to one embodiment.

FIG. **11** depicts a tractor and a trailer mated through a 5th wheel hitch and through an electrical receptacle and an electrical plug, according to one embodiment.

FIG. **12** depicts an electrical receptacle and electrical plug with the switch and actuator coupling, container reader, and identification tag of FIG. **1**, according to one embodiment.

FIG. **13** is a process flow chart outlining a mating event between the tractor and trailer of FIG. **11**, including a mating event between an electrical system of the tractor and trailer, according to one embodiment.

Other features of the present embodiments will be apparent from the accompanying drawings and from the detailed description that follows.

DETAILED DESCRIPTION

Example embodiments, as described below, may be used to provide a method, a system, and/or an apparatus of implementing container verification through an electrical receptacle and plug associated with a container and a transport vehicle of an intermodal freight transport system, according to one or more embodiments.

FIG. **1** is a schematic view illustrating a coupling of a container **106** to a chassis **100** pulled by a truck tractor, according to one embodiment. Particularly, FIG. **1** depicts a coupling **101**A of a first switch **102** of a housing **105** of a chassis **100** to a second actuator **108** of the container **106** when the container **106** is placed on the chassis **100**. In addition, FIG. **1** depicts a coupling **101**B of a second switch **110** of the container **106** to a first actuator **104** of a housing **105** of the chassis **100** when the container **106** is placed on the chassis **100**. The chassis **100** may provide a capability to mount a container **106**. The container **106** may be a standard, reusable steel box used to safely, efficiently, and/or securely transport a shipment of goods distributed through an intermodal freight transport system. The chassis **100** may be a secure container docking trailer associated with an intermodal transport vehicle (e.g., a railcar, a truck) as part of an intermodal freight transport system.

A switch (e.g. a first switch **102**, a second switch **110**) may be an electrical component that, when trigged by an actuator (e.g. a first actuator **104**, a second actuator **108**), may complete or interrupt an electrical circuit. The switch may be a magnetic switch or a pressure switch. The actuator may be a magnet in the case of a magnetic switch or an application of pressure by the container **106** in the case of a pressure switch. The switch may be designed to activate (e.g. through a wake event **200** of FIG. **2**) a number of electrical devices (e.g., the container tracking device **112**, the chassis tracking device **114**, the container reader **116** of FIG. **1**) associated with the circuit when the switch is coupled to an appropriate actuator.

FIG. **2** is a schematic view illustrating an activation of a container reader **116** of a chassis **100**, a container tracking device **112**, and/or a chassis tracking device **114** based on the coupling, of FIG. **1**, of the container **106** to the chassis **100**, according to one embodiment. Particularly, FIG. **2** illustrates signaling a wake event **200** to a container tracking device **112** when the first switch **102** and the first actuator **104** of the chassis **100** is coupled with the second actuator **108** and the second switch **110** of the container **106**. The container tracking device **112** may be a self-powered telemetry device designed to power on based on the signaling of the wake event **200** in FIG. **2**. The container tracking device **112** may include an internal battery **202** and a GPS **204**.

FIG. **2** illustrates powering the container tracking device **112** through an internal battery **202** of the container tracking device **112** based on the wake event **200**. Furthermore, FIG. **2** also depicts activating a chassis tracking device **114** and a container reader **116** of the chassis when the first switch **102** of the chassis **100** is coupled with the second actuator **108** of the container **106**. The chassis tracking device **114** and the container reader **116** may receive power (e.g., 7-way power) from a transport vehicle associated with the chassis **100**. The chassis tracking device **114** may also include a GPS **206**. A global positioning system (e.g., the GPS **204**, the GPS **206**) may be an integrated space-based satellite system that provides location and time information of at least one of the container **106** and the chassis **100** to an administrative server **306** to be displayed through an administrative graphics user interface **702**, as shown in FIG. **7**.

A container reader **116** may be a radio frequency identification scanner or an optical scanner designed to gather data from a tag (e.g., the identification tag **118** of FIG. **1**) attached to an object. The container reader **116** may receive power (e.g., 7-way power) from a transport vehicle associated with the chassis **100**. The container reader **116** may be activated by the coupling **101**A of the second actuator **108** of the container **106** to the first switch **102** of the chassis **100**. The container reader **116** may be configured to read an identification tag **118** of the container **106** to discover a container identification number **302** based on the coupling **101**A of the second actuator **108** of the container **106** to the first switch **102** of the chassis **100**.

It should be noted that the chassis **100** may include an electrical power plug and/or an electrical receptacle, according to common industry practice. Further, it should be noted that the container **106** may be considered a trailer **1102**, according to another embodiment and industry practice. For example, an intermodal shipping container may be a semi-truck trailer.

According to an embodiment of FIG. **11**, the tractor **1100** includes an electrical receptacle **1104** to couple an electrical system of the tractor **1100** and the trailer **1102**. Further, the container **106** may include an electrical plug **1106** and/or an electrical receptacle **1104** to provide coupling of an electrical system thereof to a transport vehicle, in one or more embodiments. Furthermore, an existing electrical plug and/or electrical receptacle of the tractor **1100**, the trailer **1102**, and/or the container **106** may provide an optimal location to place the switch and actuator coupling **101**B, as well as the identification tag **118** and container reader **116**, according to one embodiment.

FIG. **3** is schematic view illustrating a communication of a location data **300** and a container identification number **302** to an administrative server **306** through a network **304** by at least one of a container tracking device **112** and a chassis tracking device **114** of FIG. **2**, according to one embodiment. Specifically, FIG. **3** illustrates generating, through a GPS **204** or a GPS **206** of at least one of the container tracking device **112** and the chassis tracking device **114**, a location data **300** when the first switch **102** and the first actuator **104** of the chassis **100** is coupled with the second actuator **108** and the second switch **110** of the container **106**. In addition, FIG. **3** also illustrates reading an identification tag **118** of the container **106** through a container reader **116** of the chassis **100** to discover a container identification number **302** when the first switch **102** and the first actuator **104** of the chassis **100** is coupled with the second actuator **108** and the second switch **110** of the container **106**. Furthermore, FIG. **3** also illustrates communicating the location data **300** and the container identification number **302** through at least one of the container tracking device **112** and the chassis tracking device **114**, through a network **304**, to an administrative server **306**.

The network **304** (e.g., WAN, mobile, telecommunications, internet, intranet, and/or ZigBee network) may enable communication between the container tracking device and the administrative server **306** and between the chassis tracking device **114** and the administrative server **306**. The administrative server **306** may be a remote processing and storage device associated with an intermodal freight transport system. The administrative server **306** may aggregate the location data **300** and the container identification number **302** of a multiplicity of containers in a case table **700** and may geographically display the location of the multiplicity of containers through an administrative graphics user interface **702** of the administrative server **306**, as shown in FIG. **7**.

Referring to FIG. **7**, depicted is an administrative view of a case table **700** listing a plurality of communication events associated with an intermodal freight transport system and an administrative graphics user interface view **702** illustrating a geographical origin of the events based on the communication, of FIG. **3**, of a location data **300** and a container identification number **302** to an administrative server **306** through the network **304**, according to one embodiment. The case table **700** may designate an event number **704**, a container number **706**, a location **708**, and/or an event type **710**. The event number **704** may indicate a chronological order of the events. The container number **706** may be based on a container identification number **302** discovered through a container reader **116** reading an identification tag **118** of a container **106**. The location **708** may be based on a location data **300** generated by a GPS **204** of the container tracking device **112** and/or a GPS **206** of the chassis tracking device **114** when a first switch **102** and a first actuator **104** of the chassis **100** are coupled with the second actuator **108** and the second switch **110** of the container **106**. The event type **710** may be based on any of a plurality of events associated with the chassis **100** (e.g., an initial movement **402**, a duration **406** of continuous movement **404**, a duration **410** of a stationary condition **408** of FIG. **4**) and/or the container **106** (e.g., an opening **500** of a door **504** of the container **106**, a closing **502** of the door **504** of the container of FIG. **5**).

FIG. **4** is a time lapse diagram depicting a detection of an initial movement **402** of the chassis **100** of FIG. **1** and a calculation of a duration **406** of continuous movement **404** of the chassis and a duration **410** of a stationary condition **408** of the chassis **100** with respect to time **400**, according to one embodiment. Particularly, FIG. **4** involves detecting an initial movement **402** of the chassis **100** through the GPS **206** of the chassis tracking device **114**, determining a duration **406** of a continuous movement **404** of the chassis **100** through the GPS **206** of the chassis tracking device **114**, and/or calculating a duration **410** of a stationary condition **408** of the chassis **100** through the GPS **206** of the chassis tracking device **114**.

According to one embodiment, an initial movement **402**, a duration **406** of a continuous movement **404**, and/or a duration **410** of a stationary condition **408** may trigger a communication, through the chassis tracking device **114** of the chassis **100**, of a location data **300** generated by a GPS **206** of the chassis tracking device **114** and a container identification number **302** detected through a container reader **116** of the chassis **100**, to an administrative server **306** through a network **304**, as shown in FIG. **6**.

The initial movement **402** may be any movement after a duration of rest. The initial movement **402** may journey indicate an onset of a delivery route of the chassis **100** for the purpose of tracking the container **106** coupled to the chassis **100**. The determined duration **406** of a continuous movement **404** may indicate a continuation of the delivery route of the chassis **100** for the purpose of tracking the container **106** coupled to the chassis **100**. The calculated duration **410** of a stationary condition **408** may indicate an end of the route of the chassis **100** for the purpose of tracking the container **106** coupled to the chassis **100**. The GPS **206** of the chassis tracking device **114** may register a movement of the chassis **100** by detecting a change in the position of the chassis **100**.

FIG. **5** portrays an opening **500** and a closing **502** of a door **504** of a container **106** as detected through a door sensor **506** of the container **106** of FIG. **1**, according to one embodiment. An opening **500** and a closing **502** of a door **504** of a container **106** may be an event of interest to a client of an intermodal freight transport business.

According to one embodiment, an opening **500** and a closing **502** of a door **504** of a container **106** may trigger a communication, through the container tracking device **112** of the container **106**, of a location data **300** of the container **106** generated by a GPS **204** of the container tracking device **112**, to an administrative server **306** using a network **304**, as shown in FIG. **6**.

According to another embodiment, an opening **500** and a closing **502** of a door **504** of a container **106** may trigger a communication, through the container tracking device **112** of the container **106**, of a location data **300** of the container **106** generated by a GPS **204** of the container tracking device **112** and a container identification number **302** discovered through a container reader **116** of the chassis **100**, to an administrative server **306** using a network **304**, as shown in FIG. **6**.

FIG. **6** illustrates a communication of a container tracking device **112** and a chassis tracking device **114** to an administrative server **306** through a network **304** based on a set of events triggering the communication, according to one embodiment. The container tracking device **112** and the chassis tracking device **114** may communicate with an administrative server **306** based on a set of events triggering the

communication. The container tracking device **112** may communicate, through a network **304**, the location data **300** to an administrative server **306** based on at least one of a wake event **200**, an opening **500** of a door **504** of the container **106**, a closing **502** of the door **504** of the container **106**, and/or a daily location query **600**. The chassis tracking device **114** may communicate, through a network **304**, the location data **300** and a container identification number **302** of the container **106** to an administrative server **306** based on a detection of an initial movement **402** of the chassis **100**, a duration **406** of continuous movement **404** (e.g., every **10** minutes of continuous movement **404**), a duration **410** of a stationary condition **408** (e.g., after **6** minutes of a stationary condition **408**).

FIG. **8** is a process flow chart outlining the coupling of FIG. **1**, of a container **106** and a chassis **100** of and a subsequent communication of a location data **300** and a container identification number **302** to an administrative server **306** through at least one of a container tracking device **112** and a chassis tracking device **114**, according to one embodiment. In operation **800**, a first switch **102** of a chassis **100** is coupled to a second actuator **108** of a container **106**. In operation **802**, a second switch **110** of the container **106** is coupled to a first actuator **104** of the chassis **100**. In operation **804**, a wake event **200** is signaled to a container tracking device **112**. In operation **806**, the container tracking device **112** is powered through an internal battery **202**. In operation **808**, a chassis tracking device **114** is activated. In operation **810**, a location data **300** is generated. In operation **812**, an identification tag **118** is read through a container reader **116** to discover a container identification number **302**. In operation **814**, the location data **300** and the container identification number **302** are communicated to an administrative server **306**.

FIG. **9** is a process flow chart describing a set of events triggering the communication of FIG. **3** of a location data **300** and a container identification number **302** to an administrative server **306** through a container tracking device **112**, according to one embodiment. In operation **900**, a wake event **200** is signaled to a container tracking device **112**. In operation **902**, an opening **500** of a door **504** of the container **106** is detected. In operation **904**, a closing **502** of the door **504** of the container **106** is detected. In operation **906**, a location data **300** and a container identification number **302** is communicated through the container tracking device **112** based on the wake event **200**, the opening **500** and the closing **502** of the door **504** of the container **106**, and/or a daily location query **600** of the container **106**.

FIG. **10** is a process flow chart describing a set of events triggering a communication of a location data **300** and a container identification number **302** to an administrative server **306** through a chassis tracking device **114**, according to one embodiment. In operation **1000**, an initial movement **402** of the chassis **100** is detected. In operation **1002**, a duration **406** of a continuous movement **404** of the chassis **100** is determined. In operation **1004**, a duration **410** of a stationary condition **408** of the chassis **100** is calculated. In operation **1006**, a location data **300** and a container identification number **302** is communicated to an administrative server **306** through a chassis tracking device **114** based on an initial movement **402**, a duration **406** of a continuous movement **404**, and/or a duration **410** of a stationary condition **408** of the chassis **100**.

FIG. **11** depicts a tractor **1100** and a trailer **1102** as an alternative embodiment comprising the switch and actuator coupling. The tractor **1100** may be a vehicle that may be commonly used in a ground-based freight transportation industry (e.g., semi-truck, articulated vehicle, 5th wheel equipped vehicle, vehicle with a tractor puller engine/transmission, pick-up truck). Also, the trailer **1102** may comprise a container **106** that may be fixed to a transportation chassis including wheels and a 5^{th} wheel hitch **1108** (e.g., semi-truck trailer, freight transportation trailer, container and trailer chassis, etc.), according to another embodiment. The trailer **1102** may be used to provide ground transportation of freight with the tractor **1100**. Each of the previously disclosed components (e.g., first actuator **104**, second actuator **108**, coupling **101**, container reader **116**, identification tag **118**) may be alternatively located between the tractor **1100** and the trailer **1102**. The significance of having these components between the aforementioned elements may be that the switch and actuator coupling **101**B and the identification tag **118** and container reader **116** may be easily mated by a vehicle driver through an existing electrical adapter of the semi-truck and trailer, according to one embodiment. The functionality of the various components may be the same as previously disclosed embodiments, although with respect to a mating event between the tractor **1100** with the trailer **1102**.

According to one embodiment, the tractor **1100** may mate with the trailer **1102** via 5^{th} wheel hitch **1108** and/or an electrical harness. The electrical harness may mate the electrical system of the tractor **1100** and/or a battery therein with the electrical system trailer **1102** in order to provide electrical power to running lights, brake lights, blinkers, warning lights, and tractor-trailer communications, in one or more embodiments.

FIG. **11** depicts the electrical harness comprising an electrical receptacle **1104** of the tractor **1100** and an electrical plug **1106** of the trailer **1102**. The electrical receptacle **1104** and electrical plug **1106** may be a 7-way adapter, 4-way adapter, hardwiring with a disconnect, generic electrical harness, and/or a custom harness. Further, the electrical receptacle **1104** and electrical plug **1106** comprise to include the switch and actuator coupling, in one or more embodiments.

In one or more embodiments, various connectors may be used for the electrical receptacle **1104**, such as ones including four to seven pins which may permit a transfer of power for lighting as well as auxiliary functions such as an electric trailer brake controller, backup lights, and/or a 12V power supply for a winch, interior trailer lights, and/or a trailer power outlet, according to some embodiments. Further, the electrical receptacle **1104** may be used as a connector under the external vehicle chassis and/or embedded on the external surface, according to one embodiment. The electrical receptacle **1104** may also be placed with a mounting bracket to attach it to the vehicle chassis, according to one embodiment. This may help prevent damage that may occur if the electrical receptacle is left dangling, according to one embodiment. Furthermore, an adapter may be used to fit an existing plug and/or receptacle of a vehicle with the switch and actuator coupling and/or the identification tag **118** and container reader **116**.

Further, nearly all tractors and/or trailers in common industry production and usage have electrical receptacles **1104** and/or electrical plugs **1106** with which to couple the electrical systems of the tractor and trailer. An existing receptacle/plug may provide a surface area to place the switch and actuator coupling as well as the container reader and identification tag, according to one embodiment. Furthermore, an existing adapter may be easily removed and/or replaced with a modified electrical adapter comprising the switch and actuator coupling **101** as well as the container reader **116** and identification tag **118**, according to another embodiment.

FIG. **12** depicts the electrical receptacle **1104** and electrical plug **1106** in an electrical adapter view **1200**, according to one embodiment. The electrical receptacle **1104** comprises elec-

trical terminals **1206** to transmit electrical power to the electrical system of the trailer **1102** and/or the container **106**. The electrical receptacle **1104** may include a first flange surface **1208** and/or a housing that may contact the electrical plug **1106** during a mate event (e.g., coupling of the electrical plug **1106** and the electrical receptacle **1104**). The first flange surface **1208** and/or receptacle housing may include the first switch **102** and the first actuator **104** of FIG. **1**. Also, the electrical receptacle **1104** may include the container reader **116**. Each component may function according to previous disclosure regarding the mate event. Further, the electrical plug **1106** may include a second housing to protect the internal wiring.

According to one embodiment, the plug housing **1212** may include a second flange surface **1210**. The second flange surface **1210** and/or the plug housing **1212** surface may provide a surface area to place a plurality of components. FIG. **12** shows that the second flange surface **1210** of the electrical plug **1106** may contact the first flange surface **1208** of the electrical receptacle **1104** during a mate event. The second switch **110** and second actuator **108** as well as the identification tag **118** may be included on the second flange surface **1210** and/or plug housing **1212** of the electrical plug **1106**, according to one embodiment.

During a mate event, the first switch **102** and first actuator **104** may mate with the second actuator **108** and the second switch **110**, according to one embodiment. The second switch **110** may signal wake event **200** to the container tracking device **112**. Therefore, the container tracking device **112** may perform all of the previously disclosed functions but may be located within the trailer **1102**, according to one embodiment. The first switch **102** may signal a wake event **200** to the tractor tracking device **1202**, according to another embodiment.

In one embodiment, the tractor tracking device **1202** may be of a similar and/or same functionality of the abovementioned chassis tracking device **114**. It may include the GPS **206** and may further communicate the location data **300** and the container identification number **302** by the network **304** to the administration server **306**. According one embodiment, the tractor tracking device **1202** may be located within the tractor **1100** and/or within the cockpit of the tractor **1100**.

In another embodiment, the container reader **116** may be located on the first flange area **1208** and/or housing of the electrical receptacle **1104**. The container reader **116** may read the identification tag **118** of the trailer **1102** when the electrical plug **1106** mates with the electrical receptacle **1104**. The container reader **116** may function according to the previously disclosed embodiments. The wake event **200** and a subsequent reading of the container identification number **302** may occur at the mating of the electrical plug **1106** of the trailer **1102** to the electrical receptacle **1104** of the tractor **1100**. The container reader **116** and identification tag **118** may include any of the following technologies but is not limited to: Near-Field Communications (NFC), Radio Frequency Identification (RFID), barcode and scanner, optical sensor, smart card.

In an exemplary embodiment, the container reader **116** may identify an identification number through reading the identification tag **118**, wherein the identification number is unknown and/or is of an incorrect container and/or trailer. For example, the tractor **1100** may mate with the wrong trailer **1102** at a loading dock. Thus, the container reader **116** may identify a wrong identification number and may trigger an alert. The container reader **116** may alert a driver of the tractor **1100** through the tractor tracking device **1202**, wherein the tractor tracking device **1202** is located in the cockpit of the tractor **1100** and/or comprises a graphical user interface, in one or more embodiments. Further, the container tracking device **112** and/or the tractor tracking device **1202** may communicate that a wrong mate event has occurred to the administrative server **306** based on an unknown and/or incorrect identification tag **118** read through the container reader **116**, according to another embodiment. Furthermore, in another embodiment, wherein the administrative server **306** is notified of the wrong mate event, the driver of the tractor **1100** may receive a message (e.g., Short Message Service (SMS) text message, voice message, phone call, pager alert) to notify of the wrong mate event.

FIG. **13** is a process flow chart outlining the coupling of the electrical plug **1106** and the electrical receptacle **1104** of FIG. **11**, according to one embodiment. Further, FIG. **13** outlines a subsequent communication of the location data **300** and the container identification number **302** to the administrative server **306** through at least one of the container tracking device **112** and the tractor tracking device **1202**, according to one embodiment. In operation **1300**, the trailer **1102** may be mated to the tractor **1100** through the 5^{th} wheel hitch **1108** and the electrical harness. In operation **1302**, the electrical plug **1106** may be inserted into the electrical receptacle **1104**. In operation **1304**, the first switch **102** may be coupled to the second actuator **108**. In operation **1306**, the second switch **110** may be coupled to the first actuator **104**. In operation **1308**, the wake event **200** may be signaled to the container tracking device **112**. In operation **1310**, the container tracking device **112** may receive electrical power from an internal battery **202**. In operation **1312**, the tractor tracking device **1202** may be activated by the first switch **102**. In operation **1314**, the tractor tracking device **1202** may generate a location data **300**. In operation **1316**, the identification tag **118** may be read through the container reader **116** of the tractor **1100** in order to discover a container identification number **302**. In operation **1318**, the location data **300** and the container identification number **302** may be communicated to the administration server **306**.

An example will now be described in which the various embodiments will be explained in a hypothetical scenario. A distribution business named 'XYZ Distributors' may wish to track containers carrying shipments of goods to their respective destinations. Also, XYZ Distributor may have more containers than the numbers of tractors able to pull them. As such, XYZ Distributors may wish to separately track containers as well as chassis units. Additionally, a client of XYZ Distributors, named 'Brian', may wish to receive regular updates of the location of his shipment(s). In order to facilitate these regular updates, XYZ Distributors may wish to deploy tracking devices to track the container and the chassis, separated or not.

The tracking device of the container may trigger automatically daily, when the door of the container opens or closes, and/or when the container mounts to a chassis. The tracking device of the tractor may trigger based on a detection of movement. For example, the tractor may be tracked when the tractor starts to move, when it continues to move for a specific duration, and/or when it stops moving for a specific duration. Further, connecting a 7-way power plug of the container to the tractor may activate a container reader of the tractor and/or the tracking device. The container reader may read a tag on the container to identify a unique number associated with the container. The tracking devices may utilize a global positioning system to track the locations of the container and the tractor.

The tracking devices may transmit location data and/or container identification data to an administrative server associated with XYZ Distributors. When unhitched from the trac-

tor, containers may be stored for a prolonged period of time. The container tracking device may be powered off to conserve battery power. Or, the container tracking device may be remotely activated through a communication of the administrative server, wherein the administrative server requests a location query.

The administrative server may aggregate received data to generate a case table listing the data and an administrative graphical user interface displaying the data on a map. As such, Brian may access a personalized view of the graphical user interface for the purpose of tracking a shipment of containers being distributed by XYZ Distributor.

Although the present embodiments have been described with reference to specific example embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the various embodiments. For example, the various devices and modules described herein may be enabled and operated using hardware circuitry (e.g., CMOS based logic circuitry), firmware, software or any combination of hardware, firmware, and/or software (e.g., embodied in a machine readable medium). For example, the various electrical structure and methods may be embodied using transistors, logic gates, and/or electrical circuits (e.g., application specific integrated (ASIC) circuitry and/or Digital Signal Processor (DSP) circuitry).

In addition, it will be appreciated that the various operations, processes, and/or methods disclosed herein may be embodied in a machine-readable medium and/or a machine accessible medium compatible with a data processing system (e.g., a computer device). Accordingly, the specification and drawings are to be regarded in an illustrative in rather than a restrictive sense.

What is claimed is:

1. A method, comprising:

coupling an electrical power plug of a container and an electrical power receptacle of a transport vehicle;

activating, through a switch and an actuator coupling of at least one of the electrical power plug and the electrical power receptacle, a tracking device of the container;

verifying, through an identification tag of the container read by an electronic reader, an identity of the container upon coupling the electrical power plug to the electrical power receptacle; and

wherein reading the identification tag of the container through the electronic reader further comprises:

discovering, through the coupling of the electrical power plug to the electrical power receptacle, an identification number of the container, and

communicating, through a network, the identification number of the container to an administrative server upon discovery.

2. The method of claim **1**, further comprising:

powering, through a battery of at least one of the tracking device and the container, the tracking device based on an activation by the switch and the actuator coupling; and

waking the tracking device of the container through an electrical signal generated by the switch and the actuator coupling and based on the coupling of the electrical power plug and the electrical power receptacle.

3. The method of claim **1**, further comprising:

generating, through a global positioning system (GPS) of at least one of the tracking device of the container and a tracking device of the transport vehicle, a location data associated with at least one of the container and the transport vehicle; and

transmitting to the administrative server, on a periodic basis through the network, the location data through at least one of the tracking device of the container and the tracking device of the transport vehicle.

4. The method of claim **1**, wherein the location data and the identification number are communicated through the tracking device of the container based on at least one of the activation of the tracking device of the container and a location query of the container by the administrative server.

5. The method of claim **1**, wherein the location data and the identification number are communicated through the tracking device of the transport vehicle based on at least one of an initial movement of the transport vehicle, a duration of a continuous movement of the transport vehicle, and a duration of a stationary condition of the transport vehicle.

6. A method comprising:

activating a tracking device of at least one of a container and a transport vehicle through a switch and an actuator coupling of an electrical power plug and an electrical power receptacle;

generating, through a global positioning system (GPS) of the tracking device, a location data when the electrical power plug is coupled to the electrical power receptacle;

reading an identification tag of the container through an electronic reader of the electrical power receptacle to discover an identification number upon a mate event; and

wherein reading the identification tag of the container through the electronic reader further comprises:

discovering, through a coupling of the electrical power plug to the electrical power receptacle, the identification number of the container, and

communicating, through a network, the identification number of the container to an administrative server upon discovery.

7. The method of claim **6**, wherein the mate event comprises an action that involves the coupling of at least one of an electrical system and a mechanical system of the transport vehicle and the container.

8. The method of claim **7**, wherein the mate event further comprises:

waking the tracking device of the container through an electrical signal of the switch and the actuator coupling;

powering the tracking device of the container through a battery thereof; and

activating the tracking device of the transport vehicle through the electrical signal of the switch and actuator coupling.

9. The method of claim **6**, further comprising:

transmitting to the administrative server, through the network, at least one of the location data and the identification number through the tracking device of at least one of the container and the transport vehicle.

10. The method of claim **9**, wherein the tracking device of at least one of the container and the transport vehicle is configured to transmit at least one of the location data and the identification number based on at least one of a daily location query by the administrative server, a periodic location query by the administrative server, a manual location query by the administrative server, and the mate event.

11. The method of claim **6**, further comprising:

detecting an initial movement of the container through the GPS of the tracking device of the container;

determining, through the administrative server, a duration of a continuous movement of the container based on the location data of the GPS of the tracking device of the container; and

determining, through the administrative server, a duration of a stationary condition of the container based on the location data of the GPS of the tracking device of the container.

12. The method of claim **6**, wherein an alert message is delivered to a driver of the transport vehicle when the electronic reader identifies the identification number of an incorrect container through the identification tag based on the mate event.

13. The method of claim **6**, further comprising:

conserving battery power through deactivating the tracking device of the container when the electrical power plug is de-coupled to the electrical power receptacle.

14. A system comprising:

an electrical power receptacle of a transport vehicle;

an electrical power plug of a container;

a switch and an actuator coupling configured to signal a mate event between the electrical power plug and the electrical power receptacle;

an electronic reader configured to read an identification tag of the container comprising an identification number thereby confirming an identity of the container;

a tracking device configured to provide a location data associated with at least one of the container and the transport vehicle; and

an administrative server configured to gather location data, wherein the tracking device is communicatively coupled therewith;

wherein reading the identification tag of the container through the electronic reader comprises:

discovering, through a coupling of the electrical power plug to the electrical power receptacle, the identification number of the container; and

communicating, through a network, the identification number of the container to the administrative server upon discovery.

15. The system of claim **14**, wherein the tracking device further comprises a battery configured to supply electrical power to the tracking device based upon the mate event, wherein the battery is configured to conserve electrical power when the electrical power plug is not mated to the electrical power receptacle.

16. The system of claim **14**, wherein the tracking device activates based on the mate event, wherein the switch and the actuator coupling is configured to generate an electrical signal to turn on the tracking device.

17. The system of claim **14**, wherein the tracking device includes a global positioning system (GPS) that is configured to provide location data based on at least one of an initial movement of at least one of the container and the transport vehicle, a duration of a continuous movement of at least one of the container and the transport vehicle, and a duration of a stationary condition of the container.

18. The system of claim **14**, wherein the tracking device is configured to a transmit location data to the administrative server based on at least one of a daily location query of the tracking device by the administrative server, a periodic location query of the tracking device by the administrative server, a manual location query of the tracking device by the administrative server, and the mate event.

19. The system of claim **14**, wherein the electronic reader is coupled to the tracking device and is configured to deliver an alert message to a driver of the transport vehicle, according to the mate event, wherein the electronic reader identifies the identification number of an incorrect container through the identification tag read thereof.

20. A method, comprising:

coupling an electrical power plug of a container and an electrical power receptacle of a transport vehicle;

activating, through a switch and an actuator coupling of at least one of the electrical power plug and the electrical power receptacle, a tracking device of the container;

verifying, through an identification tag of the container read by an electronic reader, an identity of the container upon coupling the electrical power plug to the electrical power receptacle; and

detecting an initial movement of the container through a global positioning system (GPS) of the tracking device of the container;

determining, through an administrative server, a duration of a continuous movement of the container based on a location data of the GPS of the tracking device of the container; and

determining, through the administrative server, a duration of a stationary condition of the container based on the location data of the GPS of the tracking device of the container.

21. The method of claim **20**, further comprising:

powering, through a battery of at least one of the tracking device and the container, the tracking device based on an activation by the switch and the actuator coupling; and

waking the tracking device of the container through an electrical signal generated by the switch and the actuator coupling and based on the coupling of the electrical power plug and the electrical power receptacle.

22. The method of claim **20**, further comprising:

generating, through the GPS of at least one of the tracking device of the container and a tracking device of the transport vehicle, the location data associated with at least one of the container and the transport vehicle; and

transmitting to the administrative server, on a periodic basis through a network, the location data through at least one of the tracking device of the container and the tracking device of the transport vehicle.

23. The method of claim **20**, wherein reading the identification tag of the container through the electronic reader comprises:

discovering, through the coupling of the electrical power plug to the electrical power receptacle, an identification number of the container; and

communicating, through the network, the identification number of the container to the administrative server upon discovery.

24. The method of claim **23**, wherein the location data and the identification number are communicated through the tracking device of the container based on at least one of the activation of the tracking device of the container and a location query of the container by the administrative server.

25. The method of claim **23**, wherein the location data and the identification number are communicated through the tracking device of the transport vehicle based on at least one of the initial movement of the transport vehicle, the duration of the continuous movement of the transport vehicle, and the duration of the stationary condition of the transport vehicle.

26. A method comprising:

activating a tracking device of at least one of a container and a transport vehicle through a switch and an actuator coupling of an electrical power plug and an electrical power receptacle;

generating, through a global positioning system (GPS) of the tracking device, a location data when the electrical power plug is coupled to the electrical power receptacle;

reading an identification tag of the container through an electronic reader of the electrical power receptacle to discover an identification number upon a mate event;

detecting an initial movement of the container through the GPS of the tracking device of the container;

determining, through an administrative server, a duration of a continuous movement of the container based on the location data of the GPS of the tracking device of the container; and

determining, through the administrative server, a duration of a stationary condition of the container based on the location data of the GPS of the tracking device of the container.

27. The method of claim **26**, wherein the mate event comprises an action that involves a coupling of at least one of an electrical system and a mechanical system of the transport vehicle and the container.

28. The method of claim **27**, wherein the mate event further comprises:

waking the tracking device of the container through an electrical signal of the switch and the actuator coupling;

powering the tracking device of the container through a battery thereof; and

activating the tracking device of the transport vehicle through the electrical signal of the switch and the actuator coupling.

29. The method of claim **26**, further comprising:

transmitting to the administrative server, through a wireless network, at least one of the location data and the identification number through the tracking device of at least one of the container and the transport vehicle.

30. The method of claim **29**, wherein the tracking device of at least one of the container and the transport vehicle is configured to transmit at least one of the location data and the identification number based on at least one of a daily location query by the administrative server, a periodic location query by the administrative server, a manual location query by the administrative server, and the mate event.

31. The method of claim **26**, wherein an alert message is delivered to a driver of the transport vehicle when the electronic reader identifies the identification number of an incorrect container through the identification tag based on the mate event.

32. The method of claim **26**, further comprising:

conserving battery power through deactivating the tracking device of the container when the electrical power plug is de-coupled to the electrical power receptacle.

33. A system comprising:

an electrical power receptacle of a transport vehicle;

an electrical power plug of a container;

a switch and an actuator coupling configured to signal a mate event between the electrical power plug and the electrical power receptacle;

an electronic reader configured to read an identification tag of the container comprising an identification number thereby confirming an identity of the container;

a tracking device configured to provide a location data associated with at least one of the container and the transport vehicle;

an administrative server configured to gather location data, wherein the tracking device is communicatively coupled therewith; and

wherein the tracking device includes a global positioning system (GPS) that is configured to provide location data based on at least one of an initial movement of at least one of the container and the transport vehicle, a duration of a continuous movement of at least one of the container and the transport vehicle, and a duration of a stationary condition of the container.

34. The system of claim **33**, wherein the tracking device further comprises a battery configured to supply electrical power to the tracking device based upon the mate event, wherein the battery is configured to conserve electrical power when the electrical power plug is not mated to the electrical power receptacle.

35. The system of claim **33**, wherein the tracking device activates based on the mate event, wherein the switch and the actuator coupling is configured to generate an electrical signal to turn on the tracking device.

36. The system of claim **33**, wherein the tracking device is configured to a transmit location data to the administrative server based on at least one of a daily location query of the tracking device by the administrative server, a periodic location query of the tracking device by the administrative server, a manual location query of the tracking device by the administrative server, and the mate event.

37. The system of claim **33**, wherein the electronic reader is coupled to the tracking device and is configured to deliver an alert message to a driver of the transport vehicle, according to the mate event, wherein the electronic reader identifies an identification number of an incorrect container through the identification tag read thereof.

38. A method, comprising:

coupling an electrical power plug of a container and an electrical power receptacle of a transport vehicle;

activating, through a switch and an actuator coupling of at least one of the electrical power plug and the electrical power receptacle, a tracking device of the container;

verifying, through an identification tag of the container read by an electronic reader, an identity of the container upon coupling the electrical power plug to the electrical power receptacle;

wherein an alert message is delivered to a driver of the transport vehicle when the electronic reader identifies an identification number of an incorrect container through the identification tag based on a mate event.

39. The method of claim **38**, further comprising:

powering, through a battery of at least one of the tracking device and the container, the tracking device based on an activation by the switch and the actuator coupling; and

waking the tracking device of the container through an electrical signal generated by the switch and the actuator coupling and based on the coupling of the electrical power plug and the electrical power receptacle.

40. The method of claim **38**, further comprising:

generating, through a global positioning system (GPS) of at least one of the tracking device of the container and a tracking device of the transport vehicle, a location data associated with at least one of the container and the transport vehicle; and

transmitting to an administrative server, on a periodic basis through a network, the location data through at least one of the tracking device of the container and the tracking device of the transport vehicle.

41. The method of claim **38**, wherein reading the identification tag of the container through the electronic reader comprises:

discovering, through the coupling of the electrical power plug to the electrical power receptacle, the identification number of the container; and

communicating, through the network, the identification number of the container to the administrative server upon discovery.

42. The method of claim 41, wherein the location data and the identification number are communicated through the tracking device of the container based on at least one of the activation of the tracking device of the container and a location query of the container by the administrative server.

43. The method of claim 41, wherein the location data and the identification number are communicated through the tracking device of the transport vehicle based on at least one of the initial movement of the transport vehicle, the duration of the continuous movement of the transport vehicle, and the duration of the stationary condition of the transport vehicle.

44. A method comprising:

activating a tracking device of at least one of a container and a transport vehicle through a switch and an actuator coupling of an electrical power plug and an electrical power receptacle;

generating, through a global positioning system (GPS) of the tracking device, a location data when the electrical power plug is coupled to the electrical power receptacle;

reading an identification tag of the container through an electronic reader of the electrical power receptacle to discover an identification number upon a mate event;

wherein an alert message is delivered to a driver of the transport vehicle when the electronic reader identifies the identification number of an incorrect container through the identification tag based on the mate event.

45. The method of claim 44, wherein the mate event comprises an action that involves a coupling of at least one of an electrical system and a mechanical system of the transport vehicle and the container.

46. The method of claim 45, wherein the mate event further comprises:

waking the tracking device of the container through an electrical signal of the switch and the actuator coupling;

powering the tracking device of the container through a battery thereof; and

activating the tracking device of the transport vehicle through the electrical signal of the switch and the actuator coupling.

47. The method of claim 44, further comprising:

transmitting to an administrative server, through a wireless network, at least one of the location data and the identification number through the tracking device of at least one of the container and the transport vehicle.

48. The method of claim 47, wherein the tracking device of at least one of the container and the transport vehicle is configured to transmit at least one of the location data and the identification number based on at least one of a daily location query by the administrative server, a periodic location query by the administrative server, a manual location query by the administrative server, and the mate event.

49. The method of claim 44, further comprising:

conserving battery power through deactivating the tracking device of the container when the electrical power plug is de-coupled to the electrical power receptacle.

50. A system comprising:

an electrical power receptacle of a transport vehicle;

an electrical power plug of a container;

a switch and an actuator coupling configured to signal a mate event between the electrical power plug and the electrical power receptacle;

an electronic reader configured to read an identification tag of the container comprising an identification number thereby confirming an identity of the container;

a tracking device configured to provide a location data associated with at least one of the container and the transport vehicle;

an administrative server configured to gather location data, wherein the tracking device is communicatively coupled therewith; and

wherein the electronic reader is coupled to the tracking device and is configured to deliver an alert message to a driver of the transport vehicle, according to the mate event, wherein the electronic reader identifies the identification number of an incorrect container through the identification tag read thereof.

51. The system claim 50, wherein the tracking device further comprises a battery configured to supply electrical power to the tracking device based upon the mate event, wherein the battery is configured to conserve electrical power when the electrical power plug is not mated to the electrical power receptacle.

52. The system of claim 50, wherein the tracking device activates based on the mate event, wherein the switch and the actuator coupling is configured to generate an electrical signal to turn on the tracking device.

53. The system of 50, wherein the tracking device includes a global positioning system (GPS) that is configured to provide location data based on at least one of an initial movement of at least one of the container and the transport vehicle, a duration of a continuous movement of at least one of the container and the transport vehicle, and a duration of a stationary condition of the container.

54. The system of claim 50, wherein the tracking device is configured to a transmit location data to the administrative server based on at least one of a daily location query of the tracking device by the administrative server, a periodic location query of the tracking device by the administrative server, a manual location query of the tracking device by the administrative server, and the mate event.

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